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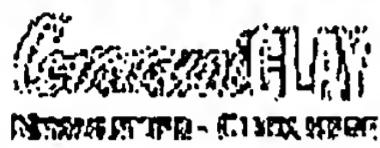
Page 1 of 1

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BENEFITS

Cloisite® nanoclays are high aspect ratio additives based on montmorillonite clay, designed and manufactured by Southern Clay Products, Inc. for the plastics industry. The information presented on these web pages is based on open literature references and SCP in-house and university research. In the test data section you will find Nylon 6 nanocomposite data as a demonstration of the technology. Look for more applications in a variety of other polymers in the future.

Exfoliation and Dispersion

Benefits from Cloisite® technology result in part from the very high surface area of montmorillonite clay - which is in excess of 750 m²/gram - and high aspect ratio (about 70 to 150). In dry form, Cloisite® exists in clusters or aggregates of montmorillonite platelets and very little surface area of the montmorillonite is exposed, causing very low aspect ratios. The challenge is to create conditions favorable for the exposure of all this potential surface area to the polymer. Two terms used to describe this achievement are exfoliation and dispersion, and both are necessary to realize the performance benefits.

Exfoliation is achieved when the individual montmorillonite platelets no longer exhibit an XRD deflection. Generally, we can assume that the absence of clay peaks in the XRD spectra indicate that the platelets are at least 70 angstroms apart. When this condition is achieved, the promised surface area is exposed and high aspect ratios gained.

The condition has been observed where XRD patterns indicate exfoliation, but areas within the composite are said to be resin rich, i.e. the absence of homogeneously dispersed montmorillonite. The conclusion is that the aggregates of montmorillonite must be exfoliated into primary platelets, and these platelets must be distributed throughout the polymer matrix homogeneously.

to the top

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Exfoliation an-

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